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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/301,906	04/29/1999	DENNIS GONSALVES	07678/077002	6222

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PAUL T. CLARK
CLARK & ELBING LLP
176 FEDERAL STREET
BOSTON, MA 02110

EXAMINER	
COLLINS, CYNTHIA E	
ART UNIT	PAPER NUMBER
1638	18

DATE MAILED: 05/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/301,906	Applicant(s) GONSALVES ET AL.	
	Examiner Cynthia Collins	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,10,12,14 and 16-34* is/are pending in the application.

4a) Of the above claim(s) *1-5,7,10,14,16-18 and 32-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6,12 and 19-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

The Amendment filed February 28, 2002, paper no.17, has been entered.

Claims 6, 19-22, 25 and 29 are newly amended.

Claims 6, 12 and 19-31 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

This application contains claims 1-5, 7, 10, 14, 16-18 and 32-34 drawn to an invention nonelected with traverse in Paper No. 14. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Drawings

A copy of Form PTO 948 is attached as requested by Applicant.

Claim Objections

The objection to Claim 6 for depending on a claim that was withdrawn as being directed to a nonelected invention is withdrawn in light of the amendment of claim 6.

Claim Rejections - 35 USC § 112

Claims 6, 12, and 19-31 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for the reasons of record set forth in the office action mailed August 29, 2002.

Applicant's arguments filed February 28, 2002, have been fully considered but they are not persuasive.

Applicant argues that the specification does not need to describe exactly all the subject matter that is claimed, but need only communicate to those skilled in the art that the claimed subject matter is intended to be part of their invention (reply page 6). Applicant argues that the specification must convey with reasonable clarity that the inventor was in possession of the claimed invention, and that every species in a genus need not be described to meet the written description requirement. Applicant argues that a specification may contain a written description of a broadly claimed invention without describing all species encompassed by the claim, and that it may not be necessary to enumerate a plurality of species if a genus is sufficiently identified by other appropriate language. Applicant asserts that these standards have been plainly met because one skilled in the art would recognize from the specification that applicants have discovered a family of related nucleic acid molecules encoding grapevine leafroll type 3 viral proteinases from a variety of viral strains (reply page 7).

Applicant points to page 7 lines 23-28 of the specification teaching the presence of a proteinase domain within the claimed gene family. Applicant asserts that even though claimed invention is exemplified by a single grapevine leafroll virus type 3 proteinase, one skilled in the art would recognize from the specification that this gene sequence is provided for illustrative purposes, and would recognize that applicants invention includes any grapevine leafroll type 3 gene encoding a proteinase polypeptide. Applicant asserts that the description allows one skilled in the art to identify and recognize other species falling within the scope of the claims (reply page 8).

Applicant argues that the specification provides a written description sufficient in detail to meet the standard set by *Eli Lilly* by describing a class of grapevine leafroll virus type 3 proteinase genes on the basis of a specific structural motif - a proteinase motif, thereby providing a description of the class of DNA molecules encompassed by the claims. Applicant asserts that the specification clearly describes the invention using "other appropriate language". For example, the specification describes a nucleic acid molecule that hybridizes to the complement of SEQ ID NO:4 under highly stringent condition, such conditions being provided in the specification at page 19 line 25 to page 20 line 3. The specification at page 7 lines 23-25 also describes that SEQ ID NO:4 encodes a polypeptide having a proteinase domain (reply page 9).

Applicant also argues that the specification satisfies the written description requirement as set for in the USPTO Written Description Guidelines, and points in particular to Example 9, where a single cDNA species encoding a protein that binds to a dopamine receptor is disclosed in the specification, and the written description requirement is satisfied for a claim that is directed to a genus of nucleic acids all of which must hybridize under high stringency with the CDNA and must encode a protein with specific activity. Applicant asserts that the facts of the instant application are squarely within these guidelines. Additionally, Applicant argues that the claimed expression vectors, host cells and grape plants are also adequately described, and points to page 10 line 5 to page 12 line 24, page 12 lines 25-30, page 14 line 3 to page 165 line 23. (reply page 10).

Regarding written description, the Examiner maintains that although every species in a genus need not be described to meet the written description requirement, and although a

specification may contain a written description of a broadly claimed invention without describing all species encompassed by the claim, it is necessary to describe a reasonable number of species. Here only a single species is described, a nucleic acid of SEQ ID NO:4 which has been assigned a proteinase function on the basis of sequence homology between the protein encoded by SEQ ID NO:4 and the prior art proteinase of Hepatitis C. Given that Applicant has disclosed the sequence of a single grapevine leafroll virus type 3 proteinase, one skilled in the art would not recognize Applicant was in possession of every grapevine leafroll type 3 gene encoding a proteinase polypeptide. The description of a single grapevine leafroll virus type 3 proteinase may allow one skilled in the art to identify structurally homologous sequences, but it does not allow one skilled in the art to identify functionally homologous sequences on the basis of structure.

Regarding the proteinase motif, reference to a proteinase motif alone does not provide a description of the class of DNA molecules encompassed by the claims. The specification does not describe the structural components of the proteinase motif that the DNA molecules encompassed by the claims would retain in order to exhibit a proteinase function. The specification also does not describe the structural components of the proteinase motif that the DNA molecules encompassed by the claims would retain in order to be distinguishable as a grapevine leafroll virus proteinase as opposed to a Hepatitis C virus or other viral proteinase.

The Examiner further maintains that the specification does not disclose the sequence of any nucleic acid molecule that hybridizes to the complement of SEQ ID NO:4 under highly stringent conditions. The recitation of hybridization conditions in the specification, combined with a reference to SEQ ID NO:4 and the recitation of functional language, is not sufficient to describe the structural features of a nucleic acid sequence that hybridizes under highly stringent

conditions to SEQ ID NO:4 and that encodes a polypeptide having proteinase activity. Such a recitation does not describe the nucleotide sequences of SEQ ID NO:4 that would be retained by a hybridizing sequence encoding a functional protein.

Regarding Example 9, illustrative of the USPTO Written Description Guidelines: Example 9 states that the specification discloses a single cDNA of SEQ ID NO:1 "which encodes a protein that binds to a dopamine receptor and stimulates adenylate cyclase activity", that the specification includes an example wherein the complement of SEQ ID NO:1 was used under highly stringent hybridization conditions for the isolation of nucleic acids "that encode proteins that bind to dopamine receptor and stimulate adenylate cyclase activity", and that although the hybridizing nucleic acids were not sequenced, they were expressed and "several were shown to encode proteins that bind to dopamine receptor and stimulate adenylate cyclase activity". The facts of the instant application are not squarely within these guidelines. In Example 9, the specification disclosed that the protein encoded by SEQ ID NO:1 was functional, whereas the instant case the specification does not disclose sufficient evidence to support a function for the protein encoded by SEQ ID NO: 4. In Example 9, the specification also included an example wherein additional nucleic acids were isolated under highly stringent hybridization conditions, and several of the nucleic acids so isolated were shown to encode functional proteins. In the instant case, the specification does not disclose the isolation of any additional nucleic acids under highly stringent hybridization conditions.

Regarding the claimed expression vectors, host cells and grape plants, they are not adequately described because they comprise a genus of sequences that is not adequately described.

Claims 6, 12, and 19-31 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, for the reasons of record set forth in the office action mailed August 29, 2002.

Applicant's arguments filed February 28, 2002, have been fully considered but they are not persuasive.

Applicant argues that a patent need not reiterate techniques known in the art in a particular area of technology, and that in view of this standard and the level of skill in the art at the time of filing, one skilled in the art would have understood how to isolate additional grapevine leafroll virus type 3 proteinase genes within the scope of the claims using standard gene cloning methods, and the determination of whether such genes conferred viral disease resistance would not constitute undue experimentation (response pages 12-13).

Applicant argues that by using the disclosed sequence and techniques known in the art, one skilled in the art could readily identify additional nucleic acid molecules encoding proteinases from any strain of grapevine leafroll type 3 virus without undue experimentation. Applicant points out that that a large amount of experimentation is not undue if it is merely routine (response pages 13-15).

Applicant argues that the specification provides sufficient guidance to practice the claimed invention in that the specification outlines on pages 18-20 general methods useful for identifying and characterizing DNAs encoding additional grapevine leafroll type 3 virus, and the

specification teaches on page 7 that the grapevine leafroll type 3 virus includes a proteinase domain that is similar to the proteinase domain of Hepatitis C (response pages 15-16).

Applicant argues that screening of recombinant libraries to isolate a grapevine leafroll type 3 virus gene sequence is considered to be a routine step in the process of isolating a gene, and does not constitute undue experimentation. Regarding whether a grapevine leafroll virus type 3 proteinase would confer viral disease resistance, Applicant points to pages 13-16 of the specification, and asserts that the ability of a proteinase sequence to confer viral resistance is easily established using any variety of methods which are known in the art, that such methods would entail only a single screening step, and thus would not constitute undue experimentation (response page 17).

Applicant argues that the claims are not necessarily overbroad even if not every grapevine leafroll virus type 3 proteinase would not confer disease resistance. Applicant points out that it is not necessary for all possible embodiments of a claim to be operative in order for the claim to be enabled. Applicant points out that the test for enablement is whether one skilled in the art, in light of the disclosure and the state of the art, could make or use the claimed invention without undue experimentation, and Applicant reiterates that considerable experimentation is permissible if it is merely routine. Applicant asserts that one skilled in the art, in light of the disclosure and the state of the art, could easily screen grapevine leafroll virus type 3 proteinases to determine the level of resistance provided by any particular proteinase without undue experimentation, and that the instant situation is indistinguishable, in all important aspects, from the facts in Wands (response pages 17-18).

Applicant argues that Nothing in the cited references of Vardi or Maiti would lead one skilled in the art to believe that expression of a grapevine leafroll virus type 3 proteinase would not confer resistance, and points out that each of Vardi and Maiti successfully generated virus resistant plants. Applicant argues that all-encompassing resistance is not necessary for enablement of the claims, and that enablement does not require absolute predictability for carrying out all possible embodiments of a claimed method. Applicant points out that the law requires that the specification combined with the prior art provide a description that allows a reasonable number of species to made and used without undue experimentation (response page 18).

Applicant also points to the case of *Ex Parte Chen*, where the Board of Patent Appeals and Interferences held that while a low success rate for integration of a desired gene demonstrates the need for a repetitive procedure, it is not sufficient to show that undue experimentation is required to practice the claimed invention. Applicant asserts that the Office has not offered any evidence that practicing the claimed invention would entail undue experimentation (response page 19).

The Examiner agrees that a patent need not reiterate techniques known in the art in a particular area of technology. However, the claims are not drawn to methods of isolating grapevine leafroll virus type 3 proteinase genes, but to nucleic acids that encode grapevine leafroll virus type 3 proteinases. Likewise, the claims are not drawn to methods for determining whether such genes confer viral disease resistance, but to a method for conferring viral disease

resistance to a plant by expressing nucleic acids that encode grapevine leafroll virus type 3 proteinases.

With respect to the nucleic acids that encode grapevine leafroll virus type 3 proteinases, the Examiner maintains that it would require undue experimentation for one of skill in the art to determine based on structure whether a sequence isolated on the basis of homology to SEQ ID NO:4 would encode a functional proteinase, given that the specification provides no guidance with respect to the structural features of SEQ ID NO:4 that must be retained in a homologous sequence for the homologous sequence to have a proteinase function. Although the specification outlines general methods useful for identifying and characterizing DNAs encoding additional grapevine leafroll type 3 virus, and teaches that the grapevine leafroll type 3 virus includes a proteinase domain that is similar to the proteinase domain of Hepatitis C, this does not enable the claimed invention. Applicant has not disclosed the structure or function of DNAs encoding additional grapevine leafroll type 3 viruses. Applicant has disclosed the only the structure of the elected sequence of SEQ ID NO:4, and has assigned the structure a function on the basis of homology to the proteinase domain of Hepatitis C virus. Structural homology suggests but does not demonstrate functional homology.

With respect to the method for conferring viral disease resistance to a plant by expressing nucleic acids that encode grapevine leafroll virus type 3 proteinases, given the unpredictability of conferring viral resistance to a plant by expressing viruses other than grapevine leafroll type 3 virus, and given the lack of guidance in the specification for conferring viral resistance to a plant by expressing a grapevine leafroll type 3 virus proteinase, the Examiner maintains that it would

require undue experimentation for one of skill in the art to confer viral disease resistance on a plant by expressing a grapevine leafroll type 3 virus proteinase.

The instant situation is distinguishable in important aspects from the facts in *Wands*. In *Wands*, the dispute over enablement centered on the predictability of producing high affinity IgM antiHBsAg antibodies for use in the claimed immunoassay methods. The Examiner maintained that the invention was not enabled because experiments disclosed in the specification suggested that obtaining such antibodies was unpredictable. The CAFC held that the invention was enabled in light of the fact that Wands had succeeded in making the required antibodies on three independent occasions, as exemplified by the working example set forth in the specification. Here Applicant has not provided even a single working example to illustrate the whether expressing the protein encoded by SEQ ID NO:4 can confer any type or amount of viral disease resistance to a transgenic plant. The amount of experimentation necessary is not the only factor to be considered in determining whether undue experimentation would be required to practice the claimed invention. Other relevant factors include the predictability of the art, the presence or absence of working examples, and the breadth of the claims. The prior art of Vardi and Maiti teach the unpredictability of conferring viral resistance to a plant by expressing the proteinase gene of viruses other than grapevine leafroll type 3 virus. Although each of Vardi and Maiti successfully generated virus resistant plants, the plants exhibited different levels and different spectrums of viral resistance. There is no prior art directed to conferring viral resistance to a transgenic plant by expressing the proteinase of a grapevine leafroll virus. Nor does Applicant provide a working example to illustrate the whether expressing the protein encoded by SEQ ID NO:4 can confer any type or amount of viral disease resistance to a transgenic plant. Here the

independent method claim 29 is broad, encompassing a method for conferring viral disease resistance in general, narrowly limited in claim 30 to resistance to grapevine leafroll virus, and more broadly limited in claim 31 to resistance to beet yellow virus, lettuce infectious yellows virus or citrus tristeza virus. In light of the unpredictability of conferring viral resistance to a plant by expressing proteinases of viruses other than grapevine leafroll type 3 virus, the lack of working examples in the specification, and the breadth of the claims, the Examiner maintains that it would require undue experimentation for one of skill in the art to practice the claimed invention.

Regarding *Ex parte Chen*, in *Chen*, the specification disclosed a low success rate for the integration of DNA encoding rainbow trout growth hormone into the genome of carp, providing evidence that the claimed invention was enabled. Here the specification does not disclose any success rate, high or low, for the ability of a grapevine leafroll type 3 proteinase to confer viral disease resistance in transgenic plants. Nor does the specification provide evidence other than structural homology that the protein encoded by SEQ ID NO:4 has a proteinase function.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Remarks

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Collins whose telephone number is (703) 605-1210. The examiner can normally be reached on Monday-Friday 8:45 AM -5:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

CC
May 15, 2002

ELIZABETH F. McELWAIN
PRIMARY EXAMINER
GROUP 1600